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09/677,867	10/03/2000	KOROMO SHIROTA	684.3087	6122

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EXAMINER

FEGGINS, KRISTAL J

ART UNIT	PAPER NUMBER
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2861

DATE MAILED: 07/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

SP

# Office Action Summary

Application No.

09/677,867

Applicant(s)

SHIROTA ET AL.

Examiner

K. Feggins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 9, 13, 19, 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishinaga et al. (EP 0 934829 A3).

**Ishinaga et al. disclose the following claimed limitations:**

\*regarding claims 1, an ink jet recording method for ejecting ink said method using an ink jet head substrate provided with a heat generating resistor, the heat generating resistor being coated with a protection film, wherein the ink is ejected by a pressure produced by generation of a bubble, the bubble being created by film boiling the ink by applying thermal energy to the ink through the protection film, the thermal energy being generated by a driving signal to the heat generating resistor, (Abstract, col 5, lines 1-5, 14-18);

\* providing a recording mode in which the ink is ejected, the ink /108/having a maximum temperature at the surface of the protection film which is in contact with the ink, of not higher than 560°C (col 5, lines 1-5, 14-18, fig 1).

\* regarding claim 2, wherein the maximum temperature applied to the ink is controlled by controlling a pulse width of the driving signal applied to the heat generating resistor (col 6, lines 26-37, figs 2, 4, 9 & 20).

\* regarding claim 3, wherein a temperature of the substrate is measured, the driving signal to the heat generating resistor being stopped when a discrimination is made that the maximum temperature may exceed 560°C, based on the temperature of the ink and the driving signal (para 0028, 0029, 0030, figs 2, 4, 9 & 20).

\* regarding claim 9, an ink jet head substrate comprising a heat generating resistor, and a protection film with which said heat generating resistor is coated, wherein heat generated by said heat generating resistor is applied to ink through said protection film to eject the ink, (Abstract, para 0028, 0029, figs 2, 4, 9 & 20).

\* wherein a maximum temperature at a surface where said protection film comes into contact with the ink is not higher than 560°C during driving of said heat generating resistor (para 0028, 0029, figs 2, 4, 9 & 20).

\* regarding claims 13, 19, an ink jet head comprising an ink jet head substrate including a heat generating resistor, a protection film with which said heat generating resistor is coated, wherein heat generated by said heat generating resistor is applied to ink through said protection film to create a bubble in the ink, to eject the ink by a

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pressure caused by the creation of the bubble (Abstract, para 0028, 0029, figs 2, 4, 9 & 20);

\* wherein a maximum temperature at a surface where said protection film comes into contact with the ink is not higher than 560°C during driving of said heat generations resistor (para 0028, 0029, figs 2, 4, 9 & 20).

\* further regarding claim 19, wherein a driving signal control means is provided for making a maximum temperature at a surface of said protection film that comes into contact with the ink not higher than 560°C during driving of said heat generating resistor (para 0028, 0029, 0030, figs 2, 4, 9 & 20).

\* regarding claim 20, wherein said driving signal control means controls a pulse width of a driving signal applied to said heat generating resistor to control the maximum temperature applied to the ink (para 0028, 0029, 0030, figs 2, 4, 9 & 20).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4-5, 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishinaga et al. (EP 0 934829 A3) in view of Hidetaka (JP 10204351).

**Ishinaga et al. disclose all of the claimed limitations except for the following:**

- \* regarding claims 4, 14; wherein the ink contains a chelate agent.
- \* regarding claims 5, 15; wherein the content of the chelate agent is not less than 50 weight ppm and not more than 20 weight %.

**Hidetaka discloses the following claimed limitations:**

- \* wherein the ink contains chelate agent (Abstract) for the purpose of improving printing images.
- \* wherein the content of the chelate agent is not less than 50 weight ppm and not more than 20 weight % (Abstract) for the purpose of achieving excellent image recordings.

It would have been obvious to one skilled in the art to utilize an ink that contains chelate agent and that a content of the chelate agent is not less than 50 weight ppm and not more than 20 weight %, taught by Hidetaka into Ishinaga et al. for the purpose of improving printing images and achieving excellent image recordings.

5. Claims 6-8, 10-12 & 16-18, 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishinaga et al. (EP 0 934829 A2)

**Ishinaga et al. disclose the following:**

- \*regarding claims 6, 10, 16; wherein said protection film comprises a plurality of layers/103, 104/, and the layer that comes into contact with the ink/108/ is an anti-cavitation/104/ film (fig 1).

**Ishinaga et al. do not disclose the following:**

\* further regarding claims 6, 10, 16; film made of amorphous alloy comprising Ta (fig 1).

\* regarding claims 7, 11, 17; wherein the amorphous alloy comprises one or more metal materials selected from a group of Fe, Cr, Re, Ge and Ni (fig 1).

\* regarding claims 8, 12, 18; wherein the amorphous alloy comprises Ta, Fe, Cr and Ni, and a content of Ta is not more than 30 weight % on the basis of the total weight of the amorphous alloy.

\* regarding claims 27-30; wherein the heat generating resistor is made of TaSiN

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a film made of amorphous alloy having Ta; an amorphous alloy having one or more metal materials selected from a group of Fe, Cr, Re, Ge and Ni; and an amorphous alloy having Ta, Fe, Cr and Ni, and a content of Ta is not more than 30 weight % on the basis of the total weight of the amorphous alloy, wherein the heat generating resistor is made of TaSiN, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use for the purpose of maintaining a temperature in which the bubble generation occurs. *In re Leshin*, 125, USPQ 416.

It would have been obvious to one skilled in the art to utilize a film made of amorphous alloy having Ta; an amorphous alloy having one or more metal materials

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selected from a group of Fe, Cr, Re, Ge and Ni; and an amorphous alloy having Ta, Fe, Cr and Ni, and a content of Ta is not more than 30 weight % on the basis of the total weight of the amorphous alloy and wherein the heat generating resistor is made of TaSiN into Ishinaga et al. for the purpose of maintaining a temperature in which the bubble generation occurs.

6. Claims 21, 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishinaga et al. (EP 0 934829 A2) in view of Nishikori et al. (5,880,751).

**Ishinaga et al. disclose the following:**

\* regarding claim 24, wherein said protection film comprises a plurality of layers/103, 104/, and the layer that comes into contact with the ink/108/ is an anti-cavitation/104/ film (fig 1).

**Ishinaga et al. does not disclose the following:**

\*regarding claim 21, wherein said ink jet head substrate includes a temperature detecting element for measuring a temperature of said substrate, and wherein the driving signal to the heat generating resistor is stopped when a discrimination is made that the maximum temperature may exceed 560°C, based on the temperature of the ink and the driving signal.

\* further regarding claim 24, film made of amorphous alloy comprising Ta (fig 1)



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\* regarding claim 25, wherein the amorphous alloy comprises one or more metal materials selected from a group of Fe, Cr, Re, Ge and Ni (fig 1).

\* regarding claim 26, wherein the amorphous alloy comprises Ta, Fe, Cr and Ni, and a content of Ta is not more than 30 weight % on the basis of the total weight of the amorphous alloy.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a film made of amorphous alloy having Ta; an amorphous alloy having one or more metal materials selected from a group of Fe, Cr, Re, Ge and Ni; and an amorphous alloy having Ta, Fe, Cr and Ni, and a content of Ta is not more than 30 weight % on the basis of the total weight of the amorphous alloy, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use for the purpose of maintaining a temperature in which the bubble generation occurs. *In re Leshin*, 125, USPQ 416.

**Nishikori et al. disclose the following claimed limitations:**

\* regarding claim 21, wherein said ink jet head substrate includes a temperature detecting element for measuring a temperature of said substrate, and wherein driving of heat generating resistor is stopped when a discrimination is made that control is not possible to make the maximum temperature may not exceed 560°C, based on the temperature of the ink and the driving signal (col 5, lines 16-35, col 9, lines 46-65, col 10, lines 11-67, col 11, lines 30-38, col 12, lines 12-50, col 17, lines 38-45, figs 1-8) for the purpose of achieving high quality recording operations.

It would have been obvious to one skilled in the art to utilize a film made of amorphous alloy having Ta; an amorphous alloy having one or more metal materials selected from a group of Fe, Cr, Re, Ge and Ni; and an amorphous alloy having Ta, Fe, Cr and Ni, and a content of Ta is not more than 30 weight % on the basis of the total weight of the amorphous alloy into Ishinaga et al. for the purpose of maintaining a temperature in which the bubble generation occurs.

It would have been obvious to one skilled in the art to utilize an ink jet head substrate includes a temperature detecting element for measuring a temperature of said substrate, and wherein driving of heat generating resistor is stopped when a discrimination is made that control is not possible to make the maximum temperature may exceed 560°C, based on the temperature of the ink and the driving signal, taught by Nishikori et al. into Ishinaga et al. for the purpose of achieving high quality recording operations.

7. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishinaga et al. (EP 0 934829 A3) as modified by Nishikori et al. (5,880,751) as applied to claim 19 above, and further in view of Hidetaka (JP 10204351).

**Ishinaga et al. as modified by Nishikori et al. disclose all of the claimed limitations except for the following:**

\* regarding claim 22; wherein the ink contains a chelate agent.

\* regarding claim 23; wherein the content of the chelate agent is not less than 50 weight ppm and not more than 20 weight %.

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**Hidetaka discloses the following claimed limitations:**

\* wherein the ink contains chelate agent (Abstract) for the purpose of improving printing images.

\* wherein the content of the chelate agent is not less than 50 weight ppm and not more than 20 weight % (Abstract) for the purpose of achieving excellent image recordings.

It would have been obvious to one skilled in the art to utilize an ink that contains chelate agent and that a content of the chelate agent is not less than 50 weight ppm and not more than 20 weight %, taught by Hidetaka into Ishinaga et al. as modified by Nishikori et al. for the purpose of improving printing images and achieving excellent image recordings.

8. Claims 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishinaga et al. (EP 0 934829 A3) in view of Hirano et al. (US 6,120,130).

**Ishinaga et al. disclose all of the claimed limitations except for the following:**

\* regarding claims 31-34; wherein the ink contains pigment.

**Hirano et al. disclose the following:**

\* wherein the ink contains pigment (col 29, lines 28-30) for the purpose of improving the ink absorbing speed of the paper.

It would have been obvious to one skilled in the art to utilize ink that contains pigment, as taught by Hirano et al. into Ishinaga et al. for the purpose of improving the ink absorbing speed of the paper.

### **Communication With The USPTO**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 571-272-2254. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patel Vip can be reached on 571-272-2458. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
**K. FEGGINS**  
**PRIMARY EXAMINER** 7/00